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to Japanese Application No. 11-288372, filed October 8, 1999.

Applicants also wish to thank the Examiner for indicating that the drawings have been approved. However, Applicants note that a Form PTO-948, indicating the Draftsperson's approval was not included with the Office Action, and Applicants respectfully request that Examiner include this paper in the next communication from the U.S.P.T.O.

Reconsideration and withdrawal of the restriction requirement and rejections of record are respectfully requested.

***Summary of Status of Amendments and Office Action***

In the present amendment, claims 3-6 and 9 are amended and claims 7, 11 and 12 are canceled. Therefore, claims 1-6, 8-10 and 13-15 remain pending in the application with claims 1-6 being independent.

In the Office Action, the Restriction Requirement dated November 1, 2001, was deemed proper and made final.

In the Office Action, claims 3-12 are rejected, and claims 1-2 and 13-15 are withdrawn from consideration.

Claims 3 and 5-7 are rejected under U.S.C. § 101 as being directed to non-statutory subject matter.

Claims 3-12 are rejected under 35 U.S.C. § 112, first paragraph, as not being enabled.

Claims 3-12 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

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Claims 4-12 are rejected under 35 U.S.C. § 102(a) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Wang et al.

***Explanation and Support for Amendments***

Applicant submits that each of the foregoing amendments is fully supported by the specification and/or was suggested by the Examiner. For example, please refer to pages 4-6 of the specification.

***Response to Restriction Requirement***

Applicants note that the Examiner has made the Restriction Requirement final. However, Applicants are allowing the non-elected claims to remain pending until such time as an indication of allowability is received in this application.

***Verified English Translation of Priority Document***

In response to the Examiner's comments regarding the perfection of the claim of priority, Applicants enclose herewith a verified English language translation of Japanese Application No. 11-288372, filed October 8, 1999 in the Japanese language.

***Response to § 101 Rejection***

Claims 3 and 5-7 are rejected under 35 U.S.C. § 101 as being directed to non-statutory

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subject matter. In response, Applicants have adopted the Examiner's suggestion and amended claims 3 and 5-6 to specifically recite that the DNA is purified. Thus, Applicants respectfully request that this ground of rejection is moot and the rejection should be withdrawn.

***Response to § 112, first paragraph Rejections***

Claims 3-12 are rejected under 35 U.S.C. § 112, first paragraph, as not being enabled. In response, claim 3-6 and 9 have been amended to even more clearly recite the present invention and render moot the rejection. Applicants respectfully submit that these amendments are clarifying amendments which do not narrow the scope of the claimed invention.

Claim 3 is rejected under 35 U.S.C. § 112, first paragraph, because the specification does not provide a sequence for a gene, including promoters and other regulatory elements as well as introns and exons. In response, Applicants have amended the claims to more clearly state that it is the purified DNA sequence set forth in SEQ ID NO:2 which is the subject matter of the claim and render moot the rejection. Applicants respectfully request that the Examiner withdraw this rejection.

Claims 5, 7 and 12 are rejected under 35 U.S.C. § 112, first paragraph, because the specification does not provide any specific description of the structure and function of the mutants generated. In response, claim 5 has been amended such that the claimed nucleotide sequence is that set forth in SEQ ID NO:2, with from 1 to 10 mutations, and which encodes the amino acid sequence set forth in SEQ ID NO:1, and claims 7 and 12 have been canceled. One of ordinary skill in the art, having both the nucleotide sequence set forth in SEQ ID NO:2, and the amino acid sequence set forth

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in SEQ ID NO:1 could easily make 1 to 10 mutations to SEQ ID NO:2 and create a DNA which encodes SEQ ID NO:1 using a genetic code table. Therefore, Applicants respectfully request that the Examiner withdraw this rejection.

Claim 8 is rejected under 35 U.S.C. § 112, first paragraph, because the specification does not provide any description of the structure and function of the fragment claimed. The Office Action asserts that “[w]ithout any guidance or suggestions a skilled artisan would not be able to predict the structure of a fragment that would demonstrate the same activity as the activity of the full length DNA sequence of SEQ ID NO:2.”

Initially, Applicant’s respectfully note that claim 8 does not contain a function or limitation. Instead, it merely claims a fragment of SEQ ID NO:2. Given the nature of DNA, one of ordinary skill in the art can easily make and use a sequence which is a fragment of SEQ ID NO:2. Those of ordinary skill in the art to which the invention pertains regularly make DNA fragments of known and unknown sequences as part of their everyday activities. Further, identification of a sequence as a fragment of SEQ ID NO:2 is also easily accomplished through use of a multitude of DNA analysis software including BLASTN and FASTN. In light of the fact that one of ordinary skill in the art regularly makes fragments of DNA segments, and the ease with which one of ordinary skill in the art could determine if a sequence is a fragment of SEQ ID NO:2, Applicants respectfully request that the Examiner withdraw this rejection.

Claim 9 is rejected under 35 U.S.C. § 112, first paragraph, because Applicants have not sufficiently described the hybridization conditions. In response, Applicants have eliminated the

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hybridization limitation, and more clearly stated that what is claimed is a probe comprising a fragment of SEQ ID NO:2. Therefore, this rejection is moot and Applicants respectfully request that the Examiner withdraw this rejection.

Claim 10 is rejected under 35 U.S.C. § 112, first paragraph, because the specification fails to provide the specific sequence of the primer that would anneal to the DNA template of a sequence set forth in SEQ ID NO:2. The Office Action asserts that it would take undue experimentation to design and develop a suitable primer for practicing the current claim. In response, Applicants respectfully note that the creation of a primer is such a basic step in molecular biology, i.e. for sequencing, PCR, or replication, that one of ordinary skill in the art could easily create a primer, if given a DNA sequence. Applicants respectfully assert that one of ordinary skill in the art creates one's own primers everyday, with nothing more to rely on than a DNA sequence. Therefore, Applicants respectfully assert that this rejection is without merit, and respectfully request that the Examiner withdraw this rejection.

In view of the above, Applicants respectfully request that these grounds of rejection be withdrawn, and claims 3-12 be allowed.

***Response to § 112, first paragraph Rejections***

Claims 4-12 are rejected under 35 U.S.C. § 112, second paragraph because these claims are dependant upon claim 3, but do not more narrowly define the invention. In response, claims 4-6 and 9 have been rewritten in independent form, claims 7, 11 and 12 have been canceled, and claims 8

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and 10 properly narrow claim 4. Therefore, Applicants respectfully request that this ground of rejection is moot and the rejection should be withdrawn.

Claims 3-5 are rejected under 35 U.S.C. § 112, second paragraph because these claims are dependant upon claim 1, which is a non elected claim. Claim 4 is also rejected as indefinite because the Office Action asserts that the term “cDNA corresponding to the proteins” is indefinite. Claim 8 is rejected because it is unsure which part of claim 4 claim 8 refers to. In response, claims 3-5 have been rewritten in independent form, rendering this rejection moot. Further, claim 4 has been amended such that the objected language has been deleted, also resulting in claim 8 being made more clear. Therefore, Applicants respectfully request that these grounds of rejection are moot and the rejection should be withdrawn.

Claims 4 and 5 are rejected under 35 U.S.C. § 112, second paragraph because of the use of the language “under.” In response, Applicants have followed the Examiner’s suggestion and changed the language to “of.” Therefore, Applicants respectfully request that this ground of rejection is moot and should be withdrawn.

Claims 5 and 7 are rejected under 35 U.S.C. § 112, second paragraph because of the phrase “one or more.” The Office Action asserts that it is not clear how many nucleotides are deleted, substituted, inserted or added relative to SEQ ID NO:2, nor is the position of these nucleotides clear. In response, Applicants have amended the language to “one to ten”, and have clarified the claims language to recite that the mutations do not result in a change in the amino acid sequence set forth in SEQ ID NO:1 during translation. Thus, one of ordinary skill in the art, having access to a genetic

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code table and SEQ ID NOs:1 and 2, would be able to determine which deletions, substitutions, insertions or additions could be made without changing the resulting amino acid sequence. Therefore, Applicants respectfully request that this ground of rejection is moot and should be withdrawn.

Claims 6 and 7 are rejected under 35 U.S.C. § 112, second paragraph because of the lack of antecedent basis for the term “coding region.” In response, Applicants have amended claim 6 to remove this language and have canceled claim 7. Therefore, Applicants respectfully request that this ground of rejection is moot and should be withdrawn.

Claim 10 is rejected under 35 U.S.C. § 112, second paragraph because it is asserted that the term “partial sequence” is indefinite. The Office Action asserts that it is not clear how many nucleotides there are in a primer and what is the position of the primer sequence of the primer sequence relative to claims 4-7. In response, Applicants again respectfully note that the creation of a primer is a basic step in molecular biology, and that one of ordinary skill in the art could easily create a primer, if given only a DNA sequence. Applicants respectfully assert that one of ordinary skill in the art creates primers everyday, with nothing more to go on than a DNA sequence. Applicants also respectfully note that a primer can be made from either the 5' or 3' end of a sequence, and may be made at any location within the sequence. Applicants respectfully assert that one of ordinary skill in the art understands that the term “partial sequence” means a DNA sequence which has 100% homology with SEQ ID NO:2, or a mutated SEQ ID NO:2 as claimed in claim 5, but is not “full length.” Therefore, Applicants submit the rejection is moot and respectfully request that

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the Examiner withdraw this rejection.

***Response to §§ 102(a)/103(a) Rejection***

Claims 4-12 are rejected under 35 U.S.C. § 102(a) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Wang et al. Applicants respectfully submit a verified translation of the priority document, filed October 8, 1999, thereby removing Wang et al. from the prior art. However, Applicants wish to point out that the current amendments to claims 4-6 and 9 render this rejection moot.

In particular, Wang et al. does not teach or suggest a purified mouse DNA which encodes the protein having the amino acid sequence of SEQ ID NO:1 as recited in claim 3, or a purified DNA having a nucleotide sequence of SEQ ID NO:2 as recited in claim 4. Nor does Wang et al. teach or suggest a purified DNA having a nucleotide sequence with one to ten nucleotides deleted, substituted, inserted or added relative to the nucleotide sequence of SEQ ID NO:2 and encoding the protein having the amino acid sequence of SEQ ID NO:1 as recited in claim 5. Wang et al. also does not teach or suggest a purified DNA having the nucleotide sequence consisting of the nucleotides 32-4804 of the sequence of SEQ ID NO:2 as recited in claim 6, or a probe comprising a DNA fragment comprising a part of the DNA of claim 4 as recited in claim 9. Therefore, Applicants submit the rejection is moot and respectfully request that the Examiner withdraw this rejection.



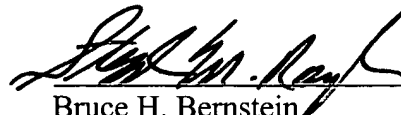
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### CONCLUSION

For the reasons advanced above, Applicants respectfully submit that all pending claims patentably define Applicants' invention. Allowance of the application with an early mailing date of the Notices of Allowance and Allowability is therefore respectfully requested.

If the Examiner has any questions concerning this matter or the application, the undersigned can be contacted at the below-listed telephone number.

Respectfully submitted,  
Susumu SEINO et al.



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**MARKED UP COPY OF AMENDED CLAIMS**

3. (Amended) A purified mouse [gene] DNA which encodes the protein [of claim 1] having the amino acid sequence of SEQ ID NO:1.

4. (Amended) A purified DNA having a nucleotide sequence [set forth under] of SEQ ID NO:2 [in the sequence listing, the DNA being a cDNA corresponding to the protein of claim 1].

5. (Amended) A purified DNA having a nucleotide sequence with one [or more] to ten nucleotides deleted, substituted, inserted or added relative to the nucleotide sequence [set forth under] of SEQ ID NO:2 [in the sequence listing] and encoding the protein [of claim 1] having the amino acid sequence of SEQ ID NO:1.

6. (Amended) A purified DNA having the nucleotide sequence [of the coding region of the DNA of claim 4] consisting of the nucleotides 32-4804 of the sequence of SEQ ID NO:2.

9. (Amended) A probe comprising a DNA [which hybridizes with] fragment comprising a part of the DNA of claim 4.